IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An imaging device to be introduced into a human or animal body for internally imaging a portion of the body, the device comprising:

an elongate member including proximal and distal ends; and

an acoustic-to-optical transducer at each of a plurality of separately addressable discrete locations distributed longitudinally along an optical core of the elongate member away from the proximal end of the elongate member, wherein the elongate member includes a sufficiently small diameter and sufficient rigidity to permit use for introducing a separate ancillary device into the body.

2. (Original) The device of claim 1, in which the elongate member includes at least one optical fiber.

3. (Original) The device of claim 2, in which the optical fiber includes a damped silica fiber.

4. (Original) The device of claim 1, in which the acoustic-to-optical transducer includes a Bragg grating sensor.

5. (Original) The device of claim 4, in which the elongate member includes at least one optical fiber, and in which the Bragg grating sensor is formed in a core of the optical fiber.

6. (Original) The device of claim 5, in which the Bragg grating includes a length, in a longitudinal direction of the elongate member, that is at least 200 times an optical wavelength of light passing through the core of the optical fiber.

7. (Original) The device of claim 4, in which the Bragg grating sensor includes a variable period.

8. (Original) The device of claim 7, further including a tunable laser, optically coupled to the Bragg grating sensor including the variable period, the laser operable to adjust an effective location of the Bragg grating sensor by adjusting a wavelength of light to select a desired portion of the Bragg grating sensor that provides a corresponding desired period.

9. (Original) The device of claim 1, further comprising an electrical-to-acoustic transducer, at least a portion of the electrical-to-acoustic transducer located away from the proximal end of the elongate member.

10. (Original) The device of claim 9, in which the electrical-to-acoustic transducer includes a piezoelectric transducer.

11. (Original) The device of claim 10, in which the elongate member includes at least one optical fiber, and in which the piezoelectric transducer includes a circumferential jacket about at least a portion of the optical fiber.

12. (Original) The device of claim 9, further comprising an electrical driver, coupled to the electrical-to-acoustic transducer.

13. (Original) The device of claim 12, in which the electrical driver is operable to couple an approximately 40 megahertz electrical signal to the electrical-to-acoustic transducer.

14. (Original) The device of claim 1, in which the elongate member includes at least one aperture.

15. (Original) The device of claim 14, in which the at least one aperture has a length, in a longitudinal direction of the elongate member, of approximately between about 151 microns and about 200 microns.

16. (Original) The device of claim 14, in which the elongate member includes a plurality of apertures disposed in a spiral pattern along the elongate member.

17. (Original) The device of claim 1, in which the elongate member is biocompatible and has a diameter of less than about 1 millimeter.

18. (Original) The device of claim 1, in which the elongate member is biocompatible and has a diameter of less than about 0.5 millimeters.

19. (Original) The device of claim 1, in which the elongate member is biocompatible and has a diameter of less than about 0.2 millimeters.

20. (Cancelled)

21. (Original) The device of claim 1, in which the elongate member comprises at least one optical fiber, the fiber including a core and a cladding about at least a portion of the core.

22. (Original) The device of claim 21, in which a diameter of the cladding varies longitudinally along the elongate member.

23. (Original) The device of claim 22, in which the diameter of the cladding varies periodically.

24. (Original) The device of claim 22, in which the diameter of the cladding varies periodically with a period that is approximately equal to an acoustic wavelength in water.

25. (Original) The device of claim 22, in which the diameter of the cladding varies periodically with a period that is approximately equal to a quasi-Lamb wavelength in the optical fiber.

26. (Original) The device of claim 21, in which the cladding includes a plurality of beads separated from each other by filler regions of lower acoustic impedance than the beads.

27. (Original) The device of claim 26, in which the beads are substantially formed from silica.

28. (Original) The device of claim 26, in which the filler regions are substantially formed from at least one of a polymer, a gel, and a fluid.

29. (Previously Presented) The device of claim 21, further comprising a piezoelectric jacket about at least a portion of the optical fiber, at least a portion of the piezoelectric jacket operating as an electrical-to-acoustic transducer.

30. (Original) The device of claim 29, in which the piezoelectric jacket is substantially formed from polyvinyldiene fluoride (PVDF).

31. (Original) The device of claim 21, in which the jacket is shaped as a spiral about the optical fiber in a longitudinal direction of the elongate member.

32. (Original) The device of claim 29, in which the jacket includes a plurality of ribs.

33. (Original) The device of claim 29, further including:
a cylindrical strength member about at least a portion of the jacket; and
a cylindrical sheath about at least a portion of the cylindrical strength member.

34. (Previously Presented) The device of claim 1, in which the elongate member includes an acoustic signal collecting lens.

35. (Original) The device of claim 1, further including a laser operatively coupled to the elongate member.

36. (Original) The device of claim 1, further including an electrical generator operatively coupled to the elongate member.

37. (Currently Amended) A method comprising:

introducing an elongate imaging device into a human or animal body, wherein the elongate imaging device includes an elongate member including an acoustic-to-optical transducer at each of a plurality of separately addressable discrete locations distributed longitudinally along an optical core of the elongate member, and wherein the elongate member includes a sufficiently small diameter and sufficient rigidity to permit use for introducing a separate ancillary device into the body;

delivering acoustic energy from a portion of the device that is located within the body;
receiving, within the body, acoustic energy reflected from the body;
transducing, within the body, the received acoustic energy into an optical signal; and
communicating the optical signal to a location outside of the body.

38. (Original) The method of claim 37, further comprising forming an image of a region within the body using the optical signal that was communicated to a location outside of the body.

39. (Previously Presented) The method of claim 37, comprising:

introducing a catheter over the elongate imaging device; and
guiding the catheter to a desired location using the elongate imaging device.

40. (Original) The method of claim 37, in which the transducing includes using a Bragg grating.

41. (Currently Amended) An imaging device for being introduced into a human or animal body for imaging an internal portion of the body, the device comprising:

an elongate member including proximal and distal ends; and

means, located on the elongate member, for performing acoustic-to-optical transducing using an acoustic-to-optical transducer at each of a plurality of separately addressable discrete locations distributed longitudinally along an optical core of the elongate member, in which the acoustic-to-optical transducer includes a user-selectable longitudinal location.

42. (Currently Amended) A device for imaging a human or animal body, the device comprising:

a guidewire, the guidewire comprising;

an optical fiber including an optical core and an acoustic-to-optical transducer at each of a plurality of separately addressable discrete locations distributed longitudinally along the optical core;

a piezoelectric jacket; and

at least one Bragg grating sensor; and

wherein the optical fiber is at least partly coated with the piezoelectric jacket, and where the at least one Bragg grating is contained within the optical fiber, and wherein the profile of the device is less than 1 millimeter in diameter, and wherein the guidewire has sufficient rigidity to permit introducing a separate ancillary device into the body using the guidewire.

43. (Original) The device of claim 42, further comprising a strength member, wherein the strength member includes at least one aperture.

44. (Original) The device of claim 42, wherein the device is an intravascular guidewire.

45. (Original) The device of claim 42, wherein the device is sized and shaped for being used for intravascular imaging in conjunction with catheterization.

46. (Original) The device of claim 42, wherein the device is sized and shaped for being used for intravascular imaging at least one of before, during, or after catheterization.

47. (Original) The device of claim 42, wherein the optical fiber comprises silicon oxide and the piezoelectric jacket comprises poled polyvinyldiene fluoride.

48. (Previously Presented) The device of claim 41, in which the acoustic-to-optical transducer includes a Bragg grating with a variable period.

49. (Previously Presented) The device of claim 48, further including a tunable laser, optically coupled to the Bragg grating sensor including the variable period, the laser operable to adjust an effective location of the Bragg grating sensor by adjusting a wavelength of light to select a desired portion of the Bragg grating sensor that provides a corresponding desired period.

50. (Previously Presented) The device of claim 41, in which the elongate member has sufficiently small diameter and sufficient rigidity to permit introducing an ancillary device into the body using the elongate member.

51. (Previously Presented) The device of claim 50, in which the elongate member is an intravascular guidewire that is sized and shaped for being used for real-time intravascular imaging in conjunction with catheterization.

52. (Previously Presented) The device of claim 41, further comprising a strength member, wherein the strength member includes at least one aperture.